DOCUMENT RESUME

ED 426 418 CS 509 950

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TITLE Cooperative Learning versus Traditional Lecture Format: A Preliminary Study.
PUB DATE 1998-11-00
NOTE 24p.; Paper presented at the Annual Meeting of the National Communication Association (84th, New York, NY, November 19-24, 1998).
PUB TYPE Reports - Evaluative (142) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Classroom Research; Classroom Techniques; Comparative Analysis; *Cooperative Learning; Higher Education; *Instructional Effectiveness; Learning Processes; *Lecture Method; Small Group Instruction
IDENTIFIERS *Jigsaw Method

ABSTRACT

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Cooperative Learning versus Traditional Lecture Format: A Preliminary Study

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Ms. Thompson's MA thesis, directed by Linda M. Pledger, was the basis for this paper.

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ABSTRACT

The purpose of this study was to conduct a preliminary examination of the efficacy of two teaching methodologies: traditional lecture versus cooperative learning. A sample of 50 students were taken from a mid-size, southern, metropolitan university. The subjects were divided into two groups: 27 who learned course material via the traditional lecture format and 23 students who learned course material via a cooperative learning technique called Jigsaw. The results failed to document any significant differences in the scores of students taught by the lecture method versus students taught by Jigsaw.

INTRODUCTION AND RATIONALE

The twentieth century has witnessed an explosion in communication with the development of telephones, televisions, fax machines and, perhaps, most significantly, computers. Even elementary school students can now access information and interact with people across the globe, via e-mail and the internet. The world is becoming more diverse as technology brings cultures closer and closer together, rapidly resulting in what Marshall McLuhan termed a global village. Despite the fact that societies are becoming more and more interdependent, our public schools may be fostering a spirit of competition rather than cooperation among students. Many educators, however, do see the need to teach students the skills to work cooperatively. This need could be met through the use of cooperative learning.

Cooperative learning is an instructional technique whereby students work in small groups on a structured task to maximize their own and other's learning potential (Johnson & Johnson, 1993). There are well-documented benefits to using cooperative learning such as higher student achievement, improved self-esteem, positive intergroup relations, even a greater liking of school and a variety of other benefits (e.g., DeVries & Edwards, 1974; Sharan, 1980; Slavin, 1983; Slavin, 1990; Slavin, 1991; Leavey & Madden, 1984; Smith, 1997).

Cooperative learning techniques have traditionally been used in K-12 classrooms. Increasing evidence suggests, however, that cooperative learning techniques may be beneficial in the college classroom and may be superior to the traditional lecture method in some ways (e.g., Glass & Putnam, 1989; Johnson, Johnson & Smith, 1987; Johnson, Johnson, & Smith, 1991; Millis, 1990; Tinto & Russo, 1995).

Many studies conclude people simply do not have a large enough attention span to assimilate fifty minutes of lecture material. Lloyd (1967) found that in a college classroom attention rises after an initial period of getting settled in, then declines until just before the end of the lecture, and then sharply falls just before class lets out.

In addition, Johnstone and Percival (1976) conducted an extensive study and involved over 90 lectures in a basic chemistry course; the results confirmed and clarified Lloyd's findings. Johnstone and Percival found that attention doesn't just decline in a direct slope, but rather the mind tends to wander in "microsleeps." They say that these periodic lapses in attention increase throughout the lecture. William James observed long ago, that actual human attention span only lasts a few seconds. He says that what is thought of an *attention* is the constant effort to bring the mind back to the topic at hand. In order to keep the student interested, as Penner (1984)

observes, the presentation of the class material can be built around the attention span in the same way television and movies are designed to capture and hold and audience's interest.

Lyons (1988) posited that adults need to participate more actively in their learning because adults are relatively independent and, in essence, can think for themselves. Similarly, Brundage (1980) claimed that "Adults learn best through effective two-way communications which emphasize learner talking and self-reflecting and teacher listening and reflecting" (p.32).

In addition, cooperative learning methods help facilitate critical thinking, which is a primary function and need of the adult learner (Smith, 1977). Students, precollege and college, tend to report positive experiences in classes where cooperative methods were used (e.g., Cooper, 1995; Kellett & Smith, 1995; Slavin, 1990).

Sheridan, Byne and Quina, (1989) however, stated that many college professors are not ready for such a radical pedagogical shift. They speculated that faculty may be uncomfortable with giving up control of the class and students may feel overwhelmed and confused by taking responsibility for their learning. Some college professors, in fact, have expressed an antipathy or skepticism about cooperative learning. Gribas (1994) for example, argued against self-directed teams in the classroom citing students' lack of interpersonal skills necessary to make teams work effectively, etc. Driskill and Polansky (1994) reported in their case study on self-directed teams in the classroom, that the quality of student's work suffered and that students simply glossed over the course material much of the time.

However, the main complaint of professors who resist using cooperative learning the college classroom is that students' learning will suffer because the class cannot cover as much material as they can using the lecture method. The key issue, then, is academic achievement as measured by test results. As Slavin (1991) noted in this extensive summary of cooperative learning research, much of the research done on cooperative learning has been done on the precollege level. The environment in the college classroom is sufficiently different from the precollege class to warrant separate investigation about using cooperative learning methods in this environment. Also, the self concept of the college learner may be substantially different from the self concept of the younger learner. Therefore, using an approach that is relying on the students' self motivation might work better in the college classroom that in the secondary school classroom. The purpose of the present study was to conduct a preliminary examination of the efficacy of two different teaching methodologies: traditional lecture versus cooperative learning.

REVIEW OF THE LITERATURE

History of Cooperative Learning

Johnson, Johnson and Smith, in *Cooperative Learning: Increasing College Faculty Instructional Productivity*, give an overview of the history of cooperative learning (1991). They date cooperative learning as a pedagogical style to Quintillion in the first century. Quintillion believed that students learn best from other students. Six centuries later, Comius (1952-1670) argued the same claim. By the 1700's, Lancaster and Bell were using cooperative learning methods at length. Later, when Colonel Francis Parker taught in Quincy, Massachusetts (1975-1880) using cooperative learning methods, he drew 30,000 visitors to observe his teaching style. Cooperative learning methods dominated up until the turn of the century. By the 1930's, however, the competition methods prevailed, in spite of John Dewey's work showing the superiority of cooperative learning. Beginning in the 1940's, this trend started to be reversed again as Kurt Lewin's and Morton Deutsch's research on small groups demonstrated that people learn best when they are actively involved with the subject matter. Today, cooperative learning methods are becoming popular again, particularly in K-12 classrooms.

Benefits of Cooperative Learning

Slavin (1991) reviewed a number of studies in cooperative learning and enumerated the benefits of cooperative learning. Cooperative learning methods have been shown to have a positive impact on academic achievement, intergroup relationships, mainstreaming, self-esteem, and others.

Academic achievement

Slavin noted that there have been 67 high-quality studies conducted in elementary and secondary schools to assess the effects of cooperative learning on student achievement. The results of sixty-one percent of these studies have documented the positive impact of cooperative learning on student achievement.

Johnson, Maruyama, Johnson, Nelson and Skon (1981) also review the research examining the effects of cooperative learning on student achievement. They reviewed 122 studies comparing the effectiveness of cooperation, cooperation with intergroup competition, interpersonal competition, and individualistic goal structures in enhancing student achievement. The results of their meta-analysis indicated that cooperation is more effective than interpersonal competition or individualistic efforts in enhancing student achievement and productivity.

Fewer studies have examined cooperative learning on the college level. McDougall and Gimple (1985) discussed the results of their application of cooperative learning at a community

college in California. They incorporated a curriculum based on Aronson's Jigsaw model into three Speech Communication classes, with a total of 80 students. At the end of the course, students completed questionnaires indicating that cooperative learning engendered a sense of trust and cohesion among students and helped clarify course goals while promoting individual learning and satisfaction. Teachers reported similar results.

Slavin (1987) noted that for cooperative learning to facilitate academic achievement, two elements must be present: (a) *group goals* and (b) *individual accountability*. This means that the group must be working toward some goal or reward and that the success of the group depends on the individual learning of each group member.

Intergroup Relations

Slavin (1991) argued that another benefit of cooperative learning was that people make friends outside their own ethnic group. In fact, Slavin claimed that students like their classmates better as a whole when cooperative learning methods are implemented. He noted that cooperative learning methods emphasize equal status among students who have different backgrounds. For example, Ziegler (1981) found a positive correlation because cooperative learning methods and positive intergroup relations. In follow-up studies conducted months later, he found that students who had participated in cooperative learning classes still named more friends outside their own ethnic groups than the control group.

Mainstreaming

Mainstreaming, according to Slavin (1991), is the practice of integrating mentally and physically challenged students with normal-progress students. In the past, as Slavin noted, this practice has created practical problems for teachers and has led to the rejection of the mentally and/or physically challenged students, thus creating a gap between the normal-progress students and the mentally or physically challenged students. Slavin posited that cooperative learning methods help facilitate acceptance. The research on cooperative learning and mainstreaming is similar to that of cooperative learning and intergroup relations. Madden and Slavin, for example, (1983) found that the use of Student Team Achievement Divisions (STAD) greatly decreased the extent to which mentally or physically challenged students were rejected.

Self-Esteem

Slavin (1991) concluded that cooperative learning methods have a positive impact on students' self-esteem. Specifically, improvements in self-esteem were documented for Team-Games-Tournament (TGT) and STAD (Slavin, 1990), as well as for Jigsaw (Blaney, Stephan, Rosenfeld, Aronson & Sikes, 1997). Slavin (1991) listed a number of additional benefits

associated with cooperative learning methods, including liking school, improved conduct, better attendance, decreased delinquency, feeling of control over one's fate in school, improved time-on-task performance and altruism.

On the other hand, Farfard (1992) identified some difficulties instructors encounter when implementing cooperative learning. He conducted interviews with two instructors over nine months and outlined specific problems the teachers experienced using the Conceptual Approach developed by Johnson and Johnson (1998). He found that instructors are not equipped to deal with the ambiguity inherent in the cooperative learning process. Additionally, he found that some students lack the interpersonal skills needed to successfully engage in cooperative learning. Teachers do not have the time to assist these students without neglecting their other responsibilities or giving up class time. Farfard observed, however, that these problems can be diminished as teachers gain more skill and understanding.

In conclusion, the majority of research documented benefits of cooperative learning. Students tended to perform better academically, intergroup relations improve, smooth mainstreaming was facilitated and self-esteem increased. This research was done primarily on the K-12 level.

Barriers to Cooperative Learning on the College Level

Cooperative learning methods have been highly successful in K-12 classrooms. Some question exists as to whether or not cooperative learning methods would be beneficial on the college level, however (Sheridan, Byne, & Quina, 1989). Few studies have examined cooperative learning and the extant research yielded mixed and/or inconclusive results.

McClintock and Sonquist's (1976) research supported cooperative learning on the college level. They found that students working in groups had better scores on the final paper than students working alone. Their sample was taken from four sections of an undergraduate sociology research methods class. The sample size was 84, with 48 in the group condition and 36 in the individual condition. Students working in the group condition were randomly assigned to a group or were assigned on a sociometric basis (i.e., mutual interest of working together on a term paper). Therefore, there were three factors: individuals working alone, individuals randomly assigned to a group and individuals sociometrically assigned to a group (The researchers note that the weakest part in the study was allowing some students to choose their own groups.) The groups were given some initial class time but also met outside of class for three weeks before the midterm. After the midterm, students in the sociometric condition were randomly assigned to new groups. They had four weeks to prepare for the final paper.

The researchers found that midterm scores of the control group and the experimental group were the same. Therefore, studying as a group or individually for a test appeared to have no impact on test scores. However, students in the group condition performed better on the term paper than those who worked as individuals. In addition, each group's grade on the term paper was compared to the grade which could have been earned by the best student in the group estimated on the basis of his or her midterm test performance. This analysis indicated that group work enhanced student achievement in terms of grades.

In contrast, Griffin's (1994) research did not provide support for cooperative learning on the college level. She examined cooperative assessment in an experiment involving 56 undergraduates enrolled in an educational psychology course. Griffin compared the pretest and post-test scores of a control group who took their tests individually, with an experimental group, who took their tests as part of a group. Griffin hypothesized that the experimental group would perform better on their tests than the control group. The results failed to support the hypothesis.

Griffin offered two possible explanations for this unexpected outcome. One possibility is that cooperative assessment did not have a positive impact on student learning. Griffin dismissed this view, however, since the student perceptions taken from an anonymous survey and interview data did not support this interpretation. Another explanation for the outcome was that the control group had a substantial review of their pre-test material. Although the review was only intended to provide students with feedback on their correct responses, the students used the review to debate test items, to defend their incorrect responses and to discuss the confusing aspects of the test (all of which are group learning techniques). Griffin stated that the control group had a substantial opportunity to learn during the review. Although the hypothesis was not supported, the students in the experimental group reported on the anonymous survey and during interviews that the group assessment process was positive and felt that they learned more using the cooperative assessment method than with traditional methods.

Driskill and Polansky's research (1994) uncovered both strengths and limitations in incorporating cooperative learning methods in the college classroom. They discussed the strengths and weaknesses they found in their effort to empower students in an Organizational Communication course by placing them in teams where students structured the course.

One phase of the empowerment process was achieved through the student-generated "creativity and constraints" packet. This packet, used in place of the traditional syllabus, would guide them throughout the semester and was intended to help students take ownership of the course. This packet could be revised throughout the first few weeks of the semester with student

input.

Students also were empowered to develop requirements for meeting course objectives. Each student developed assignments designed for specific course objectives. After several revisions, students formed groups to discuss their progress and gain input from classmates.

In addition, students were empowered to develop a pre-assessment instrument. The object of this assignment was to provide students with a means to assess themselves at the beginning and at the end of the course. The final product was built from the student input and was used to evaluate student progress.

Driskill and Polansky collected data from a survey on the class culture and a communication audit of information flow, conflict management, and student reactions regarding team effectiveness.

They found the following strengths for the course:

1. The process of the student teams was similar to the process of teams in organizations.
2. Students' experiences encouraged meta-communication.
3. Students gained a practical, applied understanding of organizational communication, which most students do not receive in a traditional class.
4. Students were empowered to develop their own teaching/training methods.

They also found two limitations:

1. The course did not cover as many concepts as a traditional class would, due to its applied material.
2. Students' quality of work suffered.

In sum, their case study captures the highlights and pitfalls of cooperative learning in the college classroom. Although students are empowered and can gain an applied understanding of course material, students may not learn as much as they can in a traditional classroom, as measured by grades. Further research on the college level would help determine whether or not the strengths of cooperative learning outweigh the pitfalls.

Methods of Cooperative Learning

Student Teams Learning Techniques

Student Team Learning (STL) techniques were developed at Johns Hopkins University (Slavin, 1991). All cooperative learning methods operate on the idea that students much learn together as a team and must be responsible for one another's learning. Many methods rely on group tasks to meet this objective. STL techniques differ in that students don't simply work on

group tasks as a team, but must actually learn the material as a team.

STL techniques are guided by three principles: *team rewards, individual accountability and equal opportunities for success.* If a team meets or exceeds course objectives, the team is awarded a certificate or another type of *team reward*. *Individual accountability* means that the success of the team depends on the learning of each individual. Team members must ensure that everyone understands the course material, thus ensuring individual responsibility for the team's achievement and failure. *Equal opportunities for success* means that team members can improve their overall team score by improving their own past performances. This way, high, average and low achievers contribute to the success of the team. There are four STL methods:

Student Teams-Achievement Divisions

In STAD, students are assigned to four-member teams that represent a cross-section of sex, performance ability and ethnicity (Slavin, 1990). After the teacher presents the lesson, team members work together to make sure everyone understands the material. Students then take quizzes individually (*individual accountability*). If they exceed their past averages students are awarded points (ensuring *equal opportunity for success*). These points are formed into a team score and teams that meet certain objectives can win prizes, such as certificates (*team rewards*).

STAD has been used in grades two through college. It works best when the information is clearly defined and questions require answers that are clearly either right or wrong, such as mathematical computations, language mechanics or geography.

Research has documented that STAD can influence student achievement. Slavin's nine week study on 252 fourth and fifth-grade students in a rural school district and 84 students in a control group yielded surprising results. The study revealed an association between features of STAD and their effects (1978). In this experiment, all experimental groups were taught using the Achievement Divisions feature of STAD (i.e., scoring was based on like-ability achievement divisions for equal-opportunity evaluation.) Aside from the Achievement Divisions component, however, four components were compared. They were: team reward with a group task, team reward with an individual task, individual reward with a group task, and individual reward with an individual task. The control group was taught by the traditional lecture method. Slavin found that the experimental groups outperformed the control group. He also found that team reward, group task structure (versus individual task) was essential to academic achievement gains.

This surprising result, that group task did not have a significant impact on student achievement, led Slavin to question whether the cooperation component or the collective group rewards component was responsible for achievement gains. Slavin did a follow-up study

involving 205 seventh-grade English students. In this study, neither team reward structure nor equal-opportunity scoring produced significant results on student achievement. The one element that both the experimental group and the control group had in common was the highly structured teaching and testing system. Slavin reasoned that peer tutoring is not essential for academic achievement, but that group scoring and highly structure teaching and testing was essential.

Teams-Games-Tournament

Teams-Games-Tournament (TGT) is similar to STAD but instead of quizzes, students compete in weekly tournaments (DeVries & Slavin, 1978). Students compete in groups of three against others with similar past averages, that is, high achievers compete with high achievers and low achievers compete with low achievers. Students change their table assignments weekly based on their tournament performance. Each table winner wins six points for his or her team so high and low achievers alike have *equal opportunity for success*.

TGT also ensures *individual accountability* in that student can not receive help from teammates when competing. High performing teams earn rewards, like certificates. TGT has many similarities with STAD but the games add a sense of excitement.

DeVries and Slavin (1978) summarize 10 studies done on the effects of TGT on academic achievement. Seven of the studies showed the positive impact of TGT on achievement in mathematics, language and reading with a third, seventh and twelfth grade students. Three of the studies failed to show a positive impact on achievement in social studies compared to the traditional lecture method or modifications of the TGT method. As with STAD, different features of TGT produced different results. For example, one study focused on TGT with team rewards verses TGT with individual rewards. Team task alone did not positively affect academic achievement. Another study found that the peer-tutoring component also did not affect achievement. Team competition versus individual competition was just as effective without peer-tutoring as with peer-tutoring. An extensive study involving 72 junior high school English classes indicated that TGT was more effective than individualized instruction.

Team Assisted Individualization

Team Assisted Individualization (TAI) like STAD and TGT also uses four member groups that are mixed in performance level, sex and ethnicity that compete for rewards like certificates (Slavin, 1991) TAI is different from STAD and TGT in that it includes individualized instruction. In addition, TAI was designed to teach mathematics to grades three through six.

In TAI students first take a placement test to determine their performance level and then work at their own pace (*equal opportunity for success).* Although team members may be working

on different material, team members check each other's work according to an answer sheet and help each other learn the material. Students take final tests alone (*individual accountability).* At the end of the week, teachers reward teams (*team rewards)* that have exceeded a criterion score based on the number of tests passed.

This method allows students to establish a firm understanding of mathematics, where skills and concepts build one another, by allowing students to work at their own pace. Having team members check and monitor each other's work allows teachers to actually teach, rather than manage routine tasks.

Cooperative Integrated Reading and Composition

Cooperative Integrated Reading and composition (CIRC) was designed to teach reading and writing to upper elementary students. In CIRC, students are grouped in homogeneous pairs from two different reading groups (Slavin, 1991). As with traditional reading classes, students read from basal or literature-based readers. Teachers work directly with one group while the other group works on specific cognitive tasks, such as speculating how a story will turn out or writing responses to stories. Teams are rewarded based on the aggregate performance of all team members on class activities.

Other Cooperative Learning Methods

Jigsaw

Jigsaw was originally developed by Aronson (1978). It has been modified and adapted at Johns Hopkins University, however (Slavin, 1986). In Aronson's method, students from six member teams to study academic material that has been broken down into sub-topics. Each member of every group takes a sub-topic to study. Group members of each team who are studying the same topic meet in "expert" groups to study and discuss their sub-topic. "Experts" then return to their original teams to teach their sub-topic to the whole team.

Jigsaw required that students work together and listen carefully in order to learn the material. Sharan (1980) claimed that studies have documented Jigsaw's positive effect on students' self-esteem and students' regard for other students. There has not been sufficient research on the relationship of Jigsaw and increased academic ability. Sharon (1980) was silent on the issue of students' evaluation of their academic ability when using Jigsaw. Ventimiglia (1994) observed that this method is suited for higher education classrooms.

Group Investigation

Sharon and Sharon at the University of Tel-Aviv (Slavin, 1990) developed this method to provide students the opportunity to take an active part in their learning by choosing how and

what they want to study. Students form small groups to decide on a topic and develop a plan for researching their topic. They then divide the work among themselves and after each member has done his or her share of the research, the group synthesizes the material and presents it to the class. Specifically, the Group Investigation method involves six steps:

1. Deciding on a main topic and creating sub-topics.
2. Creating a research plan in which each student picks a sub-topic to research.
3. Carrying out the research plan.
4. Synthesizing and summarizing the research into a final group project.
5. Presenting the final report to the class.
6. Evaluation by both peers and the teacher.

Sharan's assessment of the influences of GI on academic achievement indicated that GI promoted high level cognitive functioning for the class as a whole (Sharon, 1980). Sharan noted that a limitation of his study was that his research only involved low-status ethnic groups in Israel. He has not replicated the study with students who have a middle-class, Western background. Johnson, Johnson and Skon's (1979) research on GI, however, was done on white, middle-class pupils from the United States. Their results are consonant with Sharan's findings. Although research has not shown whether or not GI will be as effective in desegregated classrooms, it appears that GI produced a higher level of learning with lower to middle class students.

Learning Together

Johnson and Johnson developed Learning Together methods at the University of Minnesota (Slavin, 1991). These methods involve groups of four or five students mixed in performance level, sex and ethnicity. The groups submit a single, final product for praise and constructive criticism. The emphasis in Learning Together methods is on team build and maintenance.

Less Formal Methods

Information Cooperative Learning Groups

Johnson, Johnson and Smith (1990) suggested that less structured and less time consuming methods may be more suitable for the college classroom. One such method is *Informal Cooperative Learning Groups* involving *focused discussions* and *turn-to-your-partner discussions*.

Focused Discussed 1. The instructor prepares a series of lecture questions and presents them to the students at the beginning of class. Students discuss the questions in pairs. The task

allows students the opportunity to organize the lecture material in advance.

Turn-To-Your-Partner Discussions. The lecture is divided into 10 to 15 minute segments. After each segment, students have three to four minutes to work on a task. Students may be asked to:

*summarize or hypothesize answers to questions being discussed.

*react to theories or concepts in the lecture.

*integrate the material being taught with past material.

*generate solutions to conflicts that the lecture has presented.

*estimate what will be discussed next.

Discussions should contain the following four components: *formulating* answers to questions, *sharing* answers with partners, *listening* to partner's answers and *creating* new answers together through the process of associating and synthesizing ideas together.

Focused Discussion 2. After the above preparations, the instructor ends the lecture by summarizing what students have learned.

Other Less Formal Methods

Johnson, Johnson and Smith (1991) listed numerous other less formal cooperative learning methods, such as *cooperative note-taking, requesting active responses, simultaneous explanation pairs*, etc. *Cooperative note-taking* is a technique in which two students work together to master the lecture information. Each partner summarizes his or her notes to the other. Both add to and correct each other's notes. *Requesting active responses* includes asking students to give their opinion, having them answer questions or raise their hands or clapping when they agree. *Simultaneous explanation pairs* ensure that every member of the class is active by having students explain their answers and by reasoning simultaneously. Students can do this individually first, and then they can explain their answers to the class or can work in small groups and explain the group's answers to the class. These methods and other less formal cooperative learning methods are detailed and discussed by Johnson, Johnson and Smith (1991) and Ventimiglia (1994).

In sum, many ways exist to structure cooperative learning. Course material and class characteristics may determine which cooperative learning method is best. Some of the more formal methods have been used on the college level, such as Jigsaw. However, less formal methods may be more practical on the college level.

Elements of Cooperative Learning

Farfard (1992) described teachers' struggles trying to incorporate cooperative learning into

their classrooms. Farfard wrote: "Teachers have no fixed and reliable models that can serve as guides for comparing intermediate outcomes with the abstract goals they seek" (p.103).

Johnson and Johnson (1993) also stressed the need for an established set of principles for structuring lessons cooperatively:

> Teachers need enough training and practice on essential elements of cooperation to become educational engineers who can take their existing lessons, curricula and courses and structure them cooperatively (p.63).

They argued that teachers could become proficient at cooperative learning methods by structuring their class activities around five essential elements:

Positive Interdependence

Johnson and Johnson wrote that positive interdependence means, "Students must believe they sink or swim together" (p. 63). There are numerous ways to structure positive interdependence. Johnson, Johnson and Smith (1991) listed four ways positive interdependence can be structured in groups.

First, teachers can establish positive goal interdependence by identifying a clear common goal for the team. Second, teachers can establish positive reward interdependence by rewarding group efforts by giving a group grade or giving certificates to groups that meet certain goals. Positive interdependence can be enhanced by establishing positive resource interdependence. This might include having the group share instructional materials or giving each student part of the lesson material to master, as in Jigsaw. Finally a teacher can establish positive role interdependence by assigning students particular roles like reader, recorder, elaborator or checker.

Rosenshine and Stevens (1986) found "checking for comprehension" to be vital to academic achievement. Many teachers do not have the time to check every students' work. By assigning a student the role of checker, students ensure that other students are actually learning.

Face-to-face promotive interaction

Face-to-face promotive active means that team members must take an active role in providing feedback, support and assistance to one another (Johnson & Johnson, 1993).

Individual accountability

Having individual accountability ensures that each member of the team completes his or her individual share of work and that no member can piggyback on some else's work. Teachers can establish individual accountability in the following six ways: keeping group sizes small, randomly calling on students to present their work to the class, observing groups to see who is contributing what to the group, assigning a student from each group the role of check to ensure

that all members are learning the material and, finally, having students teach what they are learning to each other (Johnson & Johnson & Smith, 1991).

Social skills

For groups to be effective, students must be taught social skills. People come to groups with varying levels of communication skills and throwing students together does not mean they will cooperate. Studies have shown that positive interdependence, rewards for high performing team members and effective social skills are the keys to academic achievement (Lew, Mesch, Johnson & Johnson, 1986; Mesch, Johnson & Johnson, 1988).

Group processing

Group processing allows the opportunity to discuss what methods are beneficial to the group, what methods are not beneficial, and what methods need to be changed Johnson, Johnson & Smith, 1991). Teachers can facilitate this process by explaining the purpose of group processing to students, allowing time for it, requiring student involvement, and stressing that students learn social skills. Group processing should occur within groups and with the class as a whole. The instructor should be actively involved in the group processing.

Many teachers experience difficulty when they attempt to structure their classes cooperatively. Each class and circumstance is unique. By understanding the elements of cooperative learning, teachers can adapt cooperative learning to fit their needs and the needs of individual classes. Managing these elements will allow teachers to structure lessons cooperatively.

Although many studies suggest the benefits of cooperative learning, most of the research has been done on the K-12 level. The limited research on cooperative learning on the college level has yielded mixed results. College faculty generally consider academic achievement as measured by test scores to determine whether or not cooperative learning was successful. Further study is needed on the college level to establish whether or not adults learn effectively using cooperative learning methods. Because cooperative learning methods have been so successful on the precollege level in increasing academic achievement, the researcher hypothesizes:

Students who participate in cooperative learning will
perform better on post-tests than student to listen to lectures.

METHOD

Subjects were 50 students in the basic speech communication course at a mid-size, public, metropolitan university in the Southeastern United States. The subjects were divided into two groups: 27 students learned course material in the traditional lecture format and the 23

students in a comparison group that learned the course material via the cooperative learning technique called Jigsaw.

The instructors teaching these sections were regular faculty employed at the university. One male instructor taught one section of the lecture group. Two female instructors each taught a separate section of the same course in the comparison group and the other section was in the lecture group.

Procedure

All subjects completed a pretest to determine their knowledge of the material before the treatment. The treatment for the lecture group consisted of a forty minute lecture based on Thomas-Kilman's five conflict styles. These styles are accommodating, competing, compromising, avoiding and collaborating (Thomas, 1977; Kilmann & Thomas, 1975). Students completed a post-test directly afterwards.

A comparison group learned this same material using Aronson's Jigsaw method. This method was chosen for three reasons. First, it is suitable for the college level (Ventimiglia, 1994). Second, it is ideal for enhancing students' knowledge and skill levels (Slavin, 1983). The material on the five conflict styles was designed to help people manage differences and to know when to use a particular conflict style. Third, Jigsaw is particularly appropriate for social studies or a related subject such as communication.

Students formed home groups of seven or less people. Each student was assigned one of the five conflict styles. Each home group, therefore, had a representative of each of the conflict styles. In the larger classes, students had to double up on a conflict style. For example, two students may have been responsible for the avoiding style. Students then broke into expert groups. All the avoiders went into one group, all the competers went to one group and so on. They were then given directions: *Using the hand-outs provided, your task is to be able to explain your conflict style, using as many examples as possible.* Participants spent 15 minutes in the expert groups. At the end of the time period, students returned to their home groups where they taught each other what they learned during their expert groups. Students had five minutes to spend on each style, for a total of 25 minutes. After sharing in home groups, students completed a post-test on the conflict styles.

Instrument

The researcher worked in conjunction with faculty to create a pretest and post-test. All subjects completed the same questionnaire. It consisted of 15 multiple-choice questions about the five conflict styles. The first nine questions were knowledge-based questions. Specifically, the

first five questions focused on identifying the characteristics of each style. The next four questions dealt with identifying appropriate and inappropriate situations in which to use the five conflict styles. The final six questions were application-oriented questions which asked students to apply their knowledge of the five conflict styles to specific scenarios (See appendix B).

RESULTS

Difference scores were computed for subjects by subtracting each subject's pretest score from his/her post-test score. An independent samples t-test was computed to compare the difference scores of the "jigsaw" group versus the scores of the lecture group. The results failed to confirm the hypothesis ($t=-.944$ at the $p<.05$, mean/lecture=10.44, mean/"jigsaw" group=9.87).

DISCUSSION

The results failed to document a significant difference in the scores of students taught by the lecture method versus the scores of the students taught by a cooperative learning technique called Jigsaw. These results provide the warrant for college instructors to employ cooperative learning techniques if they desire to do so. The findings suggest that college teachers who have avoided using cooperative learning techniques because they fear students learning will suffer can now use such techniques without fear. This study showed that students learn just as much by cooperative learning methods as lecture. In addition, numerous benefits from cooperative learning have been documented on the K-12 level (e. g., improved self-esteem, improved intergroup relations, liking school). These benefits (and/or others) may exist on the college level also. For this reason, when all the costs and rewards are considered, cooperative learning techniques may actually be superior to the traditional lecture method.

Limitations

There are several limitations in this study, predominantly the small sample size. While three distinct sections were surveyed, 50 students remains a relatively small sample size.

A second limitation was the lack of *individual accountability*. Students knew that they were part of an experiment (although they did not know the details of that experiment) and that their grades on the pretest and post-test would not count. If their grades were being recorded, ensuring individual accountability, students may have been more motivated to learn the material. Jigsaw is particularly dependent on *Reward for Learning* (Slavin, 1983).

Third, the study's design imposed strict time constraints. Although instructors were coached in Jigsaw, they could not process the class experience fully within the time frame of a single class period. Research indicates that cooperative learning strategies require more time than traditional learning methods (Driskill & Polansky, 1994; Sheridan, Byne & Quina, 1989). Students

had a few minutes at the beginning of class to be assigned to a home group and receive a conflict style. Then they had 15 minutes in their expert groups and then 25 minutes back in their home groups. They then took a 10 minute post-test. There simply was not adequate time for instructor processing. Normally, instructors would go from group to group providing assistance and direction (Sharan, 1980), thus making the group experience last longer. The instructors did do this to some extent, but felt pressured for time. If a pretest and post-test were not necessary for experimental purposes, the groups would have had more time and the instructor could offer more input. To use this method effectively, instructors might need to utilize more class time, eliminate the pretest and post-test, employ cooperative learning techniques in longer class periods, or continue the processing of the learning experience in subsequent classes.

Fourth, two of the three instructors were unfamiliar with Jigsaw and had never used it in their classrooms. As Farfard (1992) points out:

> As teachers learn how to use cooperative learning, they inevitably encounter problems. Some of these can be solved as teachers develop increasingly sophisticated levels of skill and understanding (p. 101).

Farfard noted that teachers have to simultaneously deal with task and relational issues. Cooperative learning methods can be difficult to coordinate at first and can be difficult to process, but these skills can be learned. A more effective method of comparing the two treatments could involve the prolonged use of cooperative learning methods in an experimental classroom so that both the instructor and the students would be familiar with the process before their academic achievement is measured. The newness of the method and the established culture of the class (i.e., the already-established styles of teaching and learning in the particular class) could negatively affect the learning that occurs in this one instance.

Fifth, although Jigsaw is considered appropriate on the college level, more informal methods may be more suitable. This may be particularly true when students knew they were not being graded. Because of the lack of grades, students may have put less emphasis on the task dimension of the experience, focusing instead on the relational dimension, which was not assessed in this study. In addition, to *Reward for Learning* Jigsaw is particularly dependent on *Task Specialization* (Slavin, 1983). Although the material on the conflict styles was geared toward mastery over skills and knowledge, which Jigsaw is designed to produce, the fact that students were not being graded may have mitigated the task focus.

Conclusion

Results from the present study indicate that cooperative learning techniques have the

same impact on test scores as lecture. These results are not consistent with the overwhelming amount of research done on cooperative learning in K-12 settings, which conclude that cooperative learning is likely to have a positive impact on academic achievement at every level. The unexpected results of this study may be due to limitations in the design and execution of the study, as described above, rather than to cooperative learning. Research beyond this exploratory study needs to be done before discounting cooperative learning as a superior pedagogical tool in higher education.

Despite these limitations described above, the present study contributes to our discipline's knowledge of instructional communication: The results suggest that teachers can communicate course material to their college-level students in more than one way without fear of decreasing level of learning. That is, college instructors need not avoid using interactive techniques in the classroom since it has been shown that interactive learning does not have a negative effect on students' learning. Indeed, these results suggest that cooperative learning techniques are as effective as the traditional lecture method.

Future Studies

The researcher recommends that the present study be replicated using a larger sample size and allowing adequate time for processing the Jigsaw experience. For example, perhaps instructors who are accustomed to using cooperative learning methods could administer the group receiving a cooperative learning treatment, while the instructors who are accustomed to lecturing could administer the treatment. Cooperative learning methods, in addition to Jigsaw, especially less formal methods which may be more appropriate for the college classroom, could be added as a third treatment.

In addition to contributing to the discipline's knowledge about instructional communication, this study raised some interesting questions about the other benefits of cooperative learning. These potential benefits are worthy of future study. If students learn the same amount of knowledge in cooperative learning classrooms as they do in the lecture classrooms but potentially experience additional benefits, then cooperative learning techniques may be a more appropriate method of instruction than lecture. Teachers who desire a more interactive approach in the classroom can use the present results as advisory as they structure their classroom activities.

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